

ABSTRACT

A method for increasing and/or modulating the yield shear stress of an electrorheological fluid includes applying a sufficient electric field to the fluid to cause the formation of chains of particles, and then applying a sufficient pressure to the fluid to cause thickening or aggregation of the chains. An apparatus for increasing and/or modulating the transfer of force or torque between two working structures includes an electrorheological fluid and electrodes through which an electric field is applied to the fluid such that particles chains of particles are formed in the fluid and, upon application of pressure to the fluid, the chains thicken or aggregate and improve the force or torque transmission.